

# Cross-Sector Collaboration and Socio-Economic Growth: The Practices of Entrepreneurial Universities

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## Abstract

The higher education role is evolving from focusing on teaching, research, and innovation to becoming a key player in shaping and influencing the entrepreneurial ecosystem. This article used the systematic literature review (SLR) method to investigate how entrepreneurial universities can encourage collaboration across sectors to drive socio-economic growth. Based on the results of identification, screening and eligibility checking of 1375 documents, 30 articles discussing entrepreneurial universities and collaboration were examined. The collaborations are driven by addressing societal issues, fostering innovation, developing commercial potential, and gaining access to funding or subsidy programs, with the role of universities strengthened by regulations on ownership of intellectual property and distribution of royalties to inventors. Collaboration is also related to the university's ability to encourage innovation and connect it with the market and the institutional framework. In addition, entrepreneurship training, apart from being closely linked to applied research, encourages academics to turn their business plans into start-up ventures. In this context, government institutions have a passive role in collaboration. Thus, to enhance a sustainable and impactful entrepreneurial ecosystem, policymakers are urged to foster an entrepreneurial and innovative culture, create conducive environments for start-up and MSME growth, and encourage active collaboration and contributions from all stakeholders.

## Keywords:

entrepreneurial university; innovation; knowledge transfer; collaboration; socio-economic development

## Introduction

There has been a greater focus on universities' role as important contributors to a region's economic development (Krishna, 2019). Universities are playing an increasingly influential role in fostering innovation and spurring regional economic growth by integrating knowledge transfer activities into their primary mission alongside academic teaching and research (O'Reilly et al., 2019). As sources of new ideas and discoveries, the transfer of knowledge from universities has positioned them as crucial players in regional and national innovation systems (Krishna, 2019; Miller et al., 2018). A sustainable model for regional socio-economic development relies on enhancing intellectual capital and institutional support. This model is knowledge-based, driven

by universities, and depends on triple-helix interactions (university, industry, government). It is accomplished through partnerships, with universities taking on an entrepreneurial role (Astuty et al., 2024; Krishna, 2019; Miller et al., 2018).

Universities are considered entrepreneurial when they apply an entrepreneurial approach by integrating various methods in their learning and teaching activities. Embracing entrepreneurship studies into university and business school curricula increasingly promotes entrepreneurial behaviour and mindsets in business and technology (Allahar & Sookram, 2019). The combination of support and intervention activities, research and advisory support, indicates that universities are an ideal starting point for promoting innovation and growth. Universities can serve as valuable sources of information regarding available funding (Culkin, 2016).

Entrepreneurial universities (EU) play a broader role than generating technology transfer through patents, licenses, and companies (Syed et al., 2023). Entrepreneurship is an important mechanism for achieving economic development (Chhabra et al., 2023). The paradigm of entrepreneurial universities encompasses a series of transformations that highlight the role of universities in actively facilitating the transfer of academic research knowledge (Dalmarco et al., 2018; Leydesdorff, 1995).

In the Asia-Pacific region, leading universities are placing more emphasis on policies that support start-ups, incubation, technology transfer offices, and science and technology parks. National innovation systems are increasingly acknowledging the crucial role of universities. Science and innovation policies in the region are directing universities to take the lead in driving innovation (Krishna, 2019). Moreover, evolving societal needs require increased collaboration between universities and industry to tackle pressing social challenges. As a result, many universities are reassessing their fundamental activities and research capabilities, leading to a demand for diverse and flexible knowledge transfer and business engagement methods that align with industry requirements (Miller et al., 2018).

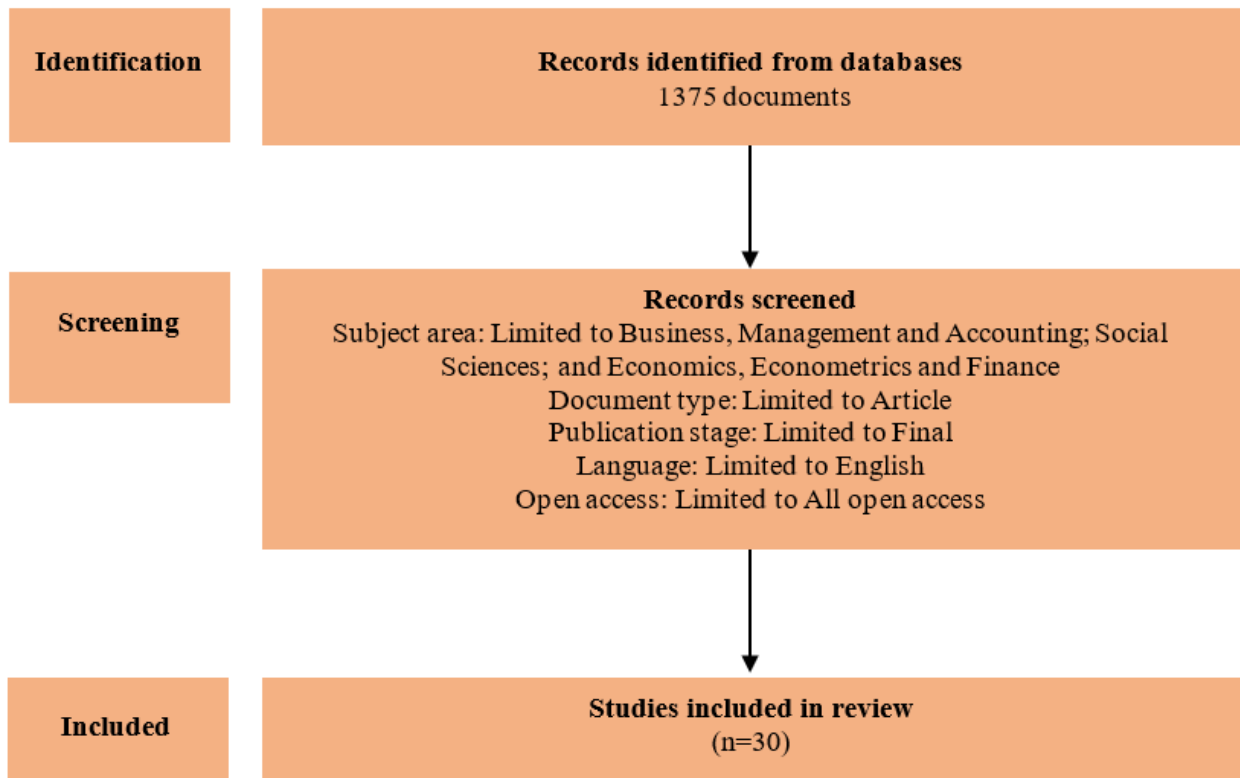
This study aims to analyse how entrepreneurial universities can foster collaboration across sectors to drive socio-economic growth, considering the dynamics of entrepreneurial university development and their roles. The analysis is based on a literature review from the past 10 years (2013 to 2023). The findings of this study will aid in developing evaluation indicators to strengthen the implementation of entrepreneurial universities and cross-sector collaboration for sustainable development.

## Methods

The literature collection was combed online with the Boolean Magic Technique using the AND, and OR operators to search full texts that combine keywords in all electronic databases. An electronic database search was conducted in April 2024. The three main steps in searching for articles are identification, screening, and eligibility, as shown in Fig. 1. After the search was complete, the results were analysed by: (1) selecting papers to be included in the review; (2) filtering the articles that were relevant to the topic; and (3) checking the full text and selecting or excluding articles based on the inclusion or exclusion criteria determined.

**Figure 1.**

**Flow diagram template for systematic reviews**



## Result and Discussion

### *The entrepreneurial university concept*

Formerly, initiatives from MIT and Stanford, as well as European universities, led to the emergence of entrepreneurial universities in developing countries. Many universities have started creating business incubators and science parks to connect with companies, promote technology transfer, foster entrepreneurship, and encourage academic research, all while attracting students. Government initiatives drove the first wave of entrepreneurial universities, the second by industry demand, and the third primarily by universities. Faced with a lack of government support and a disconnect between the industrial sector and academic activities, universities have begun to develop their entrepreneurial policies and activities, drawing on the influence of the first two waves. In recent years, the establishment of high-tech start-ups is a key component of government policy in many countries. Public-private partnerships are seen as an effective means of developing educational infrastructure and transforming educational programs (Abdimomynova, 2021).

The entrepreneurial university concept involves three missions. The first mission is teaching, which is the primary function of the university. The second mission involves research activities aimed at generating and sharing knowledge beyond the academic sphere. Due to financial pressures, universities have taken on a third mission: participating in economic development activities like technology transfer to help modernise low- and medium-tech companies (Allahar & Sookram, 2019).

The entrepreneurial perspective is widely recognised as a significant catalyst for academic entrepreneurship. It serves to inspire students to discern market opportunities and formulate comprehensive business plans. Within this context, university policies and support mechanisms play a pivotal role in presenting novel ideas and prospects to students aspiring to establish their ventures. Additionally, students learn about various ways to implement their business plans (Dalmarco et al., 2018; Odei & Novak, 2023; Samuel Adegbile et al., 2023).

The other dimension, external relations, plays a vital role in connecting students with market demand and opportunities. It serves as a platform where several start-ups can recognise and pursue market opportunities that stem from the various activities promoted by the university. The university's external relations play a pivotal role in connecting students with market demand and opportunities. Within this framework, several start-ups have successfully

identified and capitalised on market opportunities stemming from various activities championed by the university (Dalmarco et al., 2018; Odei & Novak, 2023; Samuel Adegbile et al., 2023).

Furthermore, the availability of university resources and innovation programs is tied to the university's infrastructure, which fosters entrepreneurship and innovation. Despite the accessibility of these resources, only a limited number of entrepreneurs take advantage of them, possibly due to their stage of development or the nature of the services they provide. Business incubators and science parks serve as mechanisms that bolster and promote academic entrepreneurship (Odei & Novak, 2023; Samuel Adegbile et al., 2023).

In entrepreneurial universities, scientific research serves as the primary wellspring of innovative entrepreneurial concepts. Through this process, universities actively facilitate the establishment of technology start-ups, thereby playing a pivotal role in contributing to socio-economic development, a fundamental objective of entrepreneurial universities. (Dalmarco et al., 2018; Wijnker et al., 2015).

The entrepreneurial university supports local enterprises and serves as a primary catalyst for innovation. This concept is an integral component of the triple helix model, which fosters collaborative partnerships among academic institutions, governmental bodies, and industry (Bugrov et al., 2023; Pickernell et al., 2019). Entrepreneurial universities are required to engage comprehensively with the industry and undertake research that yields a positive societal impact (Miller et al., 2018). In these universities, proactive engagement with stakeholders is advanced through diverse channels, such as consulting services, research and development initiatives, technology transfer, participation in and ownership of science parks and incubators, and endeavours to attract faculty and student projects (Louw & Moloji, 2013).

### **Critical factors**

Some factors that influence the implementation of entrepreneurial universities are as follows. First, *strategy*. The strategy encompasses how universities incorporate entrepreneurship education into their overall strategy. It includes aligning it with the university's mission, strategic objectives, and operations to enhance the university's strategic entrepreneurship program. These strategic objectives should be embedded at every level of university leadership and reflected in the policies of each department. University employees and the director must support the program (Astuty et al., 2024; Castro et al., 2019; B. Fischer et al., 2021; Pupp & Filep, 2021). Secondly, resources are another important factor in entrepreneurship program development, such as funds, available resource types, and possible university income through patents, consulting, or

product sales. Continuous resource availability is also important to ensure program sustainability (Castro et al., 2019; Johnston et al., 2023).

The next factor that influences the implementation of entrepreneurial universities is infrastructure. It includes not only the infrastructure to support education but also the development and improvement of infrastructure for incubators or entrepreneurship centres, as well as entrepreneurship research and studies (Abdimomynova, 2021; Astuty et al., 2024). These programs should not be limited to university courses; instead, they should serve as incentives to reduce institutional barriers and foster the exchange of ideas and knowledge among academicians and other members of society (Castro et al., 2019; Odei & Novak, 2023; Pattnaik & Pandey, 2014).

Scope. The "scope" factor is crucial for understanding the reciprocal influence between a university's entrepreneurship program, the community, and the businesses. Connections to the local business environment provide academics with opportunities to gain hands-on entrepreneurial experience and develop a more entrepreneurial mindset (Castro et al., 2019). In this regard, entrepreneurial opportunities are also influenced by previous collaborations with industry partners, prior entrepreneurial knowledge, and cognitive integratio (Chhabra et al., 2023).

Development. The "Development" factor refers to continually improving programs and activities associated with entrepreneurship by monitoring and making adjustments to meet stakeholder expectations. It includes regularly assessing programs with input from both internal and external stakeholders and then making improvements based on the needs identified in previous assessments. By using this approach, universities can establish a more supportive entrepreneurial environment (Castro et al., 2019).

### ***Evaluation framework***

Entrepreneurial universities can be evaluated using the following framework. Firstly, leadership. The university's strategic focus on entrepreneurship underscores its unwavering commitment to fostering entrepreneurial endeavours within the university community. This pivotal approach exemplifies the university's dedication to cultivating an environment conducive to entrepreneurial growth and innovation. Secondly, organisational capacity. A diverse array of funding sources is leveraged to develop and maintain a robust financial strategy while also providing incentives and rewards to faculty members in alignment with the entrepreneurship agenda. Thirdly, entrepreneurship development. The university's well-designed organisational

framework actively fosters the nurturing of an entrepreneurial mindset and the exploration and implementation of creative and groundbreaking teaching techniques. Fourthly, pathways to entrepreneurial action. Entrepreneurial endeavours are actively fostered by providing support in developing ideas into tangible outcomes, offering mentorship, and creating incubators for nurturing innovative projects. Fifthly, university relationships: The university actively cultivates meaningful connections and collaborations between cutting-edge research, innovative entrepreneurial education, diverse industries, and community initiatives to enrich and expand the knowledge ecosystem. Sixthly, internationalisation. The entrepreneurship strategy is designed to encompass a broad international perspective, emphasising global connections, engagement in diverse networks, and active participation in international exchange programs. Seventhly, impact. The university frequently assesses and evaluates its influence on the quality of teaching, the effectiveness of learning, and the level of support provided to entrepreneurship start-ups. (Allahar & Sookram, 2019).

The success of a university's strategy for technology transfer and innovation relies on its capabilities in the following areas: (1) Cultivating a collaborative culture that engages all members of the academic community and is dedicated to making a positive social impact; (2) Establishing institutional channels that facilitate partnerships with external organisations to co-create value for underserved communities; and (3) Designing incentive systems that acknowledge and incentivise researchers and faculty for their contributions to efficient innovation projects based on high-quality scientific research (Astuty et al., 2024; B. Fischer et al., 2021).

### ***Challenges and Opportunities***

The way institutions are set up at the national level can either help or hinder universities from participating in collaborative networks for innovation. The success of entrepreneurial universities' strategies for managing technology transfer in innovation is directly affected by whether appropriate policies are in place to encourage involvement in industrial activities, scientific research, and higher education (B. Fischer et al., 2021). In this context, policymakers should reconsider the distribution of tasks in industry-university partnerships in the knowledge-based economy (Hirao & Hoshino, 2024).

Entrepreneurial universities need to engage in collaboration for sustainable development. This collaboration can enable companies to effectively promote themselves and expand their markets (Brătucu et al., 2020; Rossoni et al., 2024a). Significant factors such as

funding, patents, and awards play crucial roles as drivers of technology spinouts. Among these, patents have the most substantial impact on universities' ability to transfer technology to companies. Following patents, funding significantly influences universities' capacity to file and secure patents for protecting technical innovations. Awards, on the other hand, have the least impact on this process (Odei & Novak, 2023).

Challenges at the institutional level are primarily associated with institutional support, the institutional environment, and social norms. Many institutional initiatives prioritise resources for commercialisation activities, which can undermine informal and non-commercial activities. Consequently, academics may perceive a lack of institutional support for engaging in informal collaborative activities, leading to their reluctance to participate in such endeavours (Miller et al., 2018).

Meanwhile, individual-level challenges mainly revolve around resource constraints. For instance, academics encounter a lack of opportunities and resources when initiating entrepreneurial endeavours (Miller et al., 2018). Good internal communication is crucial for developing entrepreneurial universities as it directly influences the academic community's self-efficacy in developing entrepreneurial competencies (Astuty et al., 2024). Moreover, there is a significant disparity between expectations and the current state of collaboration. The primary challenge arises from the passive involvement of government agencies in the collaboration process (Gedminaitė-Raudonė et al., 2019).

University entrepreneurship practices encourage small businesses to develop a strategic entrepreneurial mindset. The difficult challenge is to foster an entrepreneurial culture while simultaneously helping educate individuals about the process of starting a successful business. Moreover, universities serve as thought leaders in shaping the structure of the labour market. Due to their close connection to local labour market dynamics, universities are in a prime position to discern underlying trends and contribute to innovative strategies for addressing them (Culkin, 2016).

Universities must be involved in meeting the needs of companies to support business (Brătuțu et al., 2020). Innovative companies are more likely to collaborate with universities to develop radical innovations rather than incremental ones. Universities play a significant role when companies are involved in collaborations based on scientific research. Additionally, universities are more involved in government subsidy programs when collaborations involve a mix of scientific and non-scientific elements rather than being exclusively science-based. In this context, universities face challenges in responding to initiatives due to greater bureaucratic

burdens compared to companies, difficulties in communication (due to differing languages between universities and companies), and limited awareness of the availability of grants (as only a small number of companies have access to information about such programs) (Guerrero et al., 2019).

### ***Implication***

The success of innovation systems relies on strong relationships between academia/universities, industry, and state/government. In many countries, there is pressure to accelerate development, leading to the addition of a fourth 'helix' of civil society actors, resulting in a quadruple helix system of collaboration. The expansion aims to recognise the crucial role of the general public and communities in achieving knowledge and policy goals (Allahar & Sookram, 2019; Roncancio-Marin et al., 2022).

Enhancing the collaborative efforts of current stakeholders is crucial for the growth of the emerging entrepreneurial ecosystem hub. As collaboration channels expand, it is essential to put in more effort to strengthen mutual relationships and deepen collaboration among all system participants (Bayanbayeva et al., 2023; Mashau et al., 2019). The collaboration will also aid in identifying and resolving market, management, and innovation challenges by leveraging the expertise of professionals from both companies and universities (Borda-Rivera & Ortega-Paredes, 2021; Roncancio-Marin et al., 2022).

Universities should focus on strengthening internal relationships among members of the academic community to collaborate and disseminate knowledge beneficial for innovation. It is important to reduce bureaucratic barriers to external engagement and establish incentive programs that encourage participation in innovation. Innovation and sustainability are still gaining acceptance within traditional university structures, so a cultural shift is necessary to align academic incentives with innovation. These changes should be integrated into specific policies and strategies across the academic system. In this regard, companies should strengthen their relationships with universities to promote innovation and sustainable development (Rossoni et al., 2024b). Policymakers should support universities' transition towards social, environmental, and frugal innovation. A combined effort involving policymakers, universities, companies, and civil society is crucial for successful implementation (A. Fischer & McKee, 2017; Miller et al., 2018).

## **Conclusion**

The dynamics of the broader innovation ecosystem shape the influence of entrepreneurial activities within universities. This ecosystem encompasses various supporting entities, institutions, levels of engagement, and overall attitudes towards social and environmental impacts. Policies related to industry, science, innovation, and higher education establish the framework that governs the conduct of entities involved in innovation practices.

Entrepreneurial universities are expanding the scope of university-business collaboration by serving as a hub for pooling government and other funds accessible to businesses. They also offer networking opportunities, acting as facilitators connecting micro and small businesses. Access to anchor institutions seems to empower small businesses with the confidence and expertise needed to innovate and expand. It also promote collaboration between government, universities, and businesses. It is crucial to simplify programs that aim to foster collaboration between industry and universities.

Government intervention is essential for building a strong research foundation in universities. Once this foundation is established, universities and government policies need to work together to turn research potential into innovation. Sometimes, both government and university leadership are crucial, while in other cases, government policies can encourage universities to take an entrepreneurial and innovative approach. Thus, to enhance a sustainable and impactful entrepreneurial ecosystem, policymakers are urged to foster an entrepreneurial and innovative culture, create conducive environments for start-up and MSME growth, and encourage active collaboration and contributions from all stakeholders.

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